

Shorter Note

***Cystopteris tennesseensis* Confirmed Extant in Maryland**—*Cystopteris tennesseensis* Shaver (Tennessee bladder-fern) was first collected in Maryland in 1938. Yet the occurrence of this species in the state was overlooked by the standard references on the Maryland pteridophyte flora (Brown & Brown, *Herbaceous plants of Maryland*, 1979; Reed, *Ferns and fern-allies of Maryland and Delaware*, 1953). This fern also is not listed among the state's rare and endangered vascular plants (Boone, Maryland Natural Heritage Program Spec. Publ. 84-I, 1984).

The Tennessee bladder-fern is a fertile allotetraploid that originated from an ancient cross between *Cystopteris bulbifera* (L.) Bernh. and *C. protrusa* (Weath.) Blasdell (Haufler, Proc. Roy. Soc. Edinburgh 86B:315–323, 1985). This species ranges widely across the eastern and central United States from Pennsylvania south to Georgia and west to Kansas and Oklahoma (Blasdell, Mem. Torrey Bot. Club 21:1–102, 1963; Cranfill, *Ferns and fern allies of Kentucky*, 1980; Cusick, Amer. Fern J. 76:99–100, 1986; Moran, Amer. Fern J. 72:93–95, 1982). Although one of the most common *Cystopteris* species in the western part of its range, *C. tennesseensis* apparently is rare and local at its easternmost limits. However, this species is notoriously under-reported and misidentified and therefore might be more frequent in the east.

Cystopteris tennesseensis was first collected in Maryland in 1938 by Warren H. Wagner Jr. and David E. Rawlings at the Catoctin Iron Furnace in Cunningham Falls State Park near the village of Catoctin Furnace in Frederick County. The hybrid origin of the fern was not known then; the species was only described by Shaver in 1950 (Tennessee Acad. Sci. 25:107–113). In 1944 Wagner recollected the fern and published an article detailing his observations (Amer. Fern J. 34:125–127). Wagner's vouchers are deposited at GH, MICH, PH, and US.

Blasdell (1963), based upon his study of Wagner and Rawlings' specimens at PH, was the first to report Tennessee bladder-fern from Maryland. However, he did not cite Maryland material in his list of representative specimens of this species.

On August 23, 1988 I recollected *Cystopteris tennesseensis* where it had been found by Wagner and Rawlings fifty years earlier at the Catoctin Iron Furnace (Cusick 27734, MD, NCU, NY). About 100–110 plants of Tennessee bladder-fern grew on mortar between quartzite blocks on the north wall of the furnace stack, with a few small individuals on a retaining wall immediately facing the stack. Most of the plants grew above the reach of outstretched arms, a fact that contributes to their survival at this much-visited historic site.

The only other fern species associated with the Tennessee bladder-fern is *Asplenium platyneuron* (L.) BSP. The sunnier walls of the stack, where *C. tennesseensis* does not occur, also support vigorous populations of this species and *Woodsia obtusa* (Sprengel) Torrey. Wagner reported neither of these species. Instead, he noted two other *Cystopteris* on the furnace walls, *C. bulbifera* and *C. tenuis* (Michx.) Desv. This latter species has long been known as *C. fragilis* (L.) Bernh. var. *mackayi* Lawson (Moran, Castanea 48:218–223, 1983).

Neither of these bladder-ferns were observed in 1988.

Physical conditions at this site evidently have changed during the past fifty years. Wagner (p. 126) stated that "The sumac trees growing in the debris of the old furnace had become rather large and the other vegetation very dense, so that the walls where ferns grow in crevices are now most well shaded." At some time during the past 50 years the sumacs and other vegetation must have been stripped from the furnace walls. A wooden structure also has been erected along the east wall. The south and west walls now are no longer shaded and thus support such sunloving species as the woodsia. The wooden shed casts a shade too dense for the growth of plants. The north wall of the stack is shaded by a retaining wall and thus still has the mesic conditions suitable for the growth of Tennessee bladder-fern.

Despite an intensive search no additional populations of *Cystopteris tennesseensis* were found in Cunningham Falls State Park or adjacent areas. One wonders from whence came the spores that generated this isolated population. The nearest collection known to me of this species is from Berks County, Pennsylvania, nearly 160 kilometers to the northeast (Bernville, 31 May 1951, W. H. Wagner Jr. s.n. (CM, MICH)). It is not known if this or other populations of Tennessee bladder-fern are extant in Pennsylvania. Operations at the Catoctin Furnace terminated in 1903 (Singewald, Rep. Maryland Geol. Surv. 9:123-327, 1911), giving us a starting point for the establishment of the fern.

The Catoctin Furnace population of Tennessee bladder-fern should be monitored over time to assess population changes. The plants should be protected from possible attempts to "improve" the appearance of the furnace by removing the vegetation. Although more field work is needed, it appears that *Cystopteris tennesseensis* is one of the rarer members of the fern flora of Maryland and should be added to the state list of endangered vascular plants.

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